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Harold N. Rosenstock

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HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER

LAZARO, DAVID R

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/676,746
Filing Date: September 30, 2003
Appellant(s): ROSENSTOCK ET AL.

Joseph Lafata (37,166)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 09/30/08 appealing from the Office action mailed 02/06/08.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

10/676,744 - related application on appeal

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2002/0188711	MEYER ET AL	12-2002
6,778,531	KODIALAM ET AL	8-2004

Pfister, G. "InfiniBand Management Interoperability" January 7, 2003, from
infinibandta.org

Kashyap, V. "IP over InfiniBand (IPoIB) Architecture" Internet Draft, December
15, 2001, 25 pages, from ietf.org

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all
obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-6, 8-15, 17-25 and 27-29 are rejected under 35 U.S.C. 103(a) as
being unpatentable over “InfiniBand™ Management Interoperability” by Gregory
Pfister, published January 7, 2003 (hereinafter Pfister) in view of U.S. Patent
6,778,531 by Kodialam et al. (Kodialam).**

With respect to claims 1 and 20, Pfister teaches a method (and corresponding computer readable medium) for managing a set of database elements in an INFINIBAND architecture utilizing a plurality of subnet managers, each subnet manager capable of assuming a master subnet function, comprising:

assuming, by one of the plurality of subnet managers, the master subnet manager function (Pages 8: first 2 paragraphs);

storing the set of database elements in the assuming subnet manager (Pages 8: first 2 paragraphs);

replicating the set of database elements in a subnet manager not assuming the master subnet manager function (Pages 8: first 2 paragraphs);

updating the replicated set of database elements if any changes are made to the set of database elements (Pages 8: first 2 paragraphs).

Pfister does not explicitly disclose computing a derived version of the set of database elements independent of which of the plurality of subnet managers assumes the master subnet manager function. Kodialam teaches a technique computing derived database elements (Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-50: note multicast tree and forwarding tables are exemplarily database elements based on applicant's specification).

It would have been obvious to one of ordinary skill in the art to use the known technique for computing derived versions of database elements as taught by Kodialam. Using the known technique of deriving database elements to provide the storage copies desired by Pfister (see page 8) would have been obvious to one of ordinary skill.

With respect to claims 2 and 21, Pfister teaches the limitations of claims 1 and 20 respectively and further teaches wherein computing comprises the master subnet manager function computing the derived version of the database elements (Page 8: first 2 paragraphs: Master maintains a copy of the data).

With respect to claims 3 and 22, Pfister teaches the limitations of claims 1 and 20 respectively and further teaches wherein the derived version of the set of database elements is identical to the replicated set of database elements and the set of database elements regardless of which of the plurality of subnet managers assumes the master subnet manager function (Page 8: first 2 paragraphs - as each manager maintains a copy of the data, each manager can assume master operations using their copy of the data).

With respect to claims 4 and 23, Pfister teaches the limitations of claims 1 and 20 respectively and further teaches wherein computing comprises computing the derived version of the set of database elements deterministically regardless of which of the plurality of subnet managers assumes the master subnet manager function (Page 8: first 2 paragraphs - copies are synchronized through “two-phase commit protocol” for example) and (Kodialam: Fig. 4 and 5).

With respect to claims 5 and 24, Pfister teaches the limitations of claims 1 and 20 respectively and further teaches the master subnet manager function initializing the InfiniBand architecture subnet utilizing the derived version of the set of database elements (Pages 7 first paragraph and Page 8 first 2 paragraphs: managers contain the data for their subnet, standby assumes master operations with its copy of data).

With respect to claims 6 and 25, Pfister teaches the limitations of claims 1 and 20 respectively and further teaches creating a replicated set of database elements at a standby subnet manager (Page 8 first paragraph: each manager maintains a replicated database); the standby subnet manager assuming the master subnet manager function (Page 8 second paragraph: standby assumes master operations); the master subnet manager function computing the derived version of the set of database elements (Page 8 second paragraph: standby assumes master operations using its copy of the replicated data); and the master subnet manager using the replicated set of the database elements and the derived version of the set of database elements to initialize the InfiniBand architecture subnet (Page 8 second paragraph: standby assumes master operations using its copy of the replicated data).

With respect to claims 8 and 27, Pfister teaches the limitations of claims 1 and 20 respectively and further teaches wherein the derived version of the set of database elements comprises a tree determination (Kodialam: Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-5)

With respect to claims 9 and 28, Pfister teaches the limitations of claims 1 and 20 respectively and further teaches wherein the derived version of the set of database elements comprises a forwarding table assignment (Kodialam: Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-5).

With respect to claims 10 and 29, Pfister teaches the limitations of claims 9 and 28 respectively and further teaches wherein the forwarding table assignment

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comprises one of a linear forwarding table assignment and a multicast forwarding table assignment (Kodialam: Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-5)

With respect to claim 11, Pfister teaches an architecture node configured to form at least a portion of an INFINIBAND architecture subnet having a plurality of architecture nodes, a plurality of subnet managers configured to store database elements, and a master subnet manager function, the architecture node comprising:

a first subnet manager of the plurality of subnet managers capable of assuming the master subnet manager function (Pages 8: first 2 paragraphs); and

a subnet manager function configured to manage the database elements if the first subnet manager assumes the master subnet manager function, generate a replicated version of the database elements if a second subnet manager assumes the master subnet manager function (Pages 8: first 2 paragraphs).

Pfister does not explicitly disclose computing a derived version of the database elements independently of which of the plurality of subnet managers assumes the master subnet manager function. Kodialam teaches a technique computing derived database elements (Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-50: note multicast tree and forwarding tables are exemplarily database elements based on applicant's specification).

It would have been obvious to one of ordinary skill in the art to use the known technique for computing derived versions of database elements as taught by Kodialam. Using the known technique of deriving database elements to provide the storage copies desired by Pfister (see page 8) would have been obvious to one of ordinary skill.

With respect to claim 12, Pfister teaches the limitations of claim 11 and further teaches wherein the derived version of the database elements computed are identical to the database elements and the replicated version of the database elements regardless of which of the plurality of subnet managers assumes the master subnet manager function (Page 8: first 2 paragraphs - as each manager maintains a copy of the data, each manager can assume master operations using their copy of the data).

With respect to claim 13, Pfister teaches the limitations of claim 11 and further teaches wherein the derived version of the database elements are computed deterministically regardless of which of the plurality of subnet managers assumes the master subnet manager function (Page 8: first 2 paragraphs - copies are synchronized through “two-phase commit protocol” for example).

With respect to claims 14, Pfister teaches the limitations of claim 11 and further teaches the master subnet manager function is configured to initialize the InfiniBand architecture subnet utilizing the derived version of the database elements (Pages 7 first paragraph and Page 8 first 2 paragraphs: managers contain the data for their subnet, standby assumes master operations with its copy of data).

With respect to claims 15, Pfister teaches the limitations of claim 11 and further teaches wherein the replicated version of the database elements is created at the InfiniBand architecture node (Page 8 first paragraph: each manager maintains a replicated database); and wherein the master subnet manager is configured to use the replicated version of the database elements and the derived version of the database

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elements to initialize the InfiniBand architecture subnet (Page 8 second paragraph: standby assumes master operations using its copy of the replicated data).

With respect to claim 17, Pfister teaches the limitations of claim 11 and further teaches wherein the derived version of the set of database elements comprises a tree determination (Kodialam: Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-5)

With respect to claim 18, Pfister teaches the limitations of claim 11 and further teaches wherein the derived version of the set of database elements comprises a forwarding table assignment (Kodialam: Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-5).

With respect to claim 19, Pfister teaches the limitations of claim 18 and further teaches wherein the forwarding table assignment comprises one of a linear forwarding table assignment and a multicast forwarding table assignment (Kodialam: Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-5)

Claims 7, 16, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pfister in view of Kodialam and in further view of “IP over InfiniBand (IPoIB) Architecture” an Internet Draft, December 15, 2001, by Vivek Kashyap (hereinafter Kashyap).

With respect to claims 7, 16 and 26, Pfister teaches all the limitations of claims 1, 11 and 20 respectively, but does not explicitly disclose the derived version of the database elements comprises a local identifier assignment.

Kashyap teaches that data managed and used for operations by a subnet manager in an Infiniband architecture can include a local identifier assignment (Page 4, local ID - LID).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Pfister as indicated by Kashyap such that the derived version of the database elements comprises a local identifier assignment. One would be motivated to have this, as it is desirable to maintain high availability, which would include the data managed and operated upon by subnet managers, such as the local identifier assignment (In Pfister: Page 7 first 3 paragraphs).

(10) Response to Argument

Argument A.1

Appellant argues on page 7 of the appeal brief that the examiner has not established why Pfister should be modified. Appellants argues,

“Kodialam can be applied only after one of ordinary skill in the art finds a reason to provided derived versions of database to Pfister and when he is further searching for known technique for computing derived versions of database elements. The examiner has not provided such a reason and, therefore, has not established a prima facie case of obviousness.”

Examiner’s response to Argument A.1:

The grounds of rejection states, “It would have been obvious to one of ordinary skill in the art to use the known technique for computing derived versions of database

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elements as taught by Kodialam. Using the known technique of deriving database elements to provide the storage copies desired by Pfister (see page 8) would have been obvious to one of ordinary skill.” The key idea is that Pfister teaches a replication failover method for maintaining data in the case of failure (see pages 8). The replication method requires that the master and standby nodes maintain separate copies of the data such that if the master fails, the standby can assume the master role using its own copy of data.

While Pfister explicitly discloses an explicit replication of database elements, Pfister is not specific about creating a derived version of database elements. As such the examiner introduces Kodialam which discloses that a node can create a derived version of database elements related to multicast trees and forwarding tables (See for example Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-50 of Kodialam. Also note appellant’s specification describes database elements as including trees and forwarding tables: see page 19 lines 14-16 of Appellant’s Specification). Going back to Pfister, a copy of data is required at a subnet manager for failover purposes. Kodialam provides a technique for creating a copy of data at a node. What the grounds of rejection proposes is that it would be obvious to modify Pfister to use the known technique of deriving database elements as taught in Kodialam to create the copies of data at the master and standby node as required for the replication failover method.

Argument A.2

Appellant argues on page 8 of the appeal brief that Pfister teaches away from any modifications. Appellant argues,

"Pfister further explicitly teaches that "it can be said, with a significant degree of certainty, that the two methods outlined above are the only ways to achieve failover without data corruption." Pfister, pg. 8, 3rd paragraph. (emphasis added). In other words, Pfister actually teaches away from any further searching for different methods for maintaining consistent data, because Pfister, the primary reference relied upon by the Examiner, deems it fruitless... methods by Pfister. Claims 11 and 20 contain similar limitations. Appellant submits that one of ordinary skill in the art would not consider modifying Pfister to include the technique of computing independent derived database elements as Pfister itself teaches the only two methods it deems to be satisfactory."

Examiner's Response to Argument A.2:

As noted by Appellant, Pfister merely describes two **basic** ways to handle the failover (emphasis added Page 7 5th paragraph). As such, Pfister is only describing the **basic** steps of using either the replication or switchover techniques. While Pfister states the replication and switchover methods are the only ways to achieve failover, Pfister does not state that the replication method must be done specifically as described. It is logical to reason that the derived database elements of Kodialam could be used in the replication method of Pfister as part of maintaining the separate copies required in the replication method. In other words, the examiner's grounds of rejection does not seek to eliminate or replace the replication method of Pfister, but instead proposes modifying Pfister to provide an alternative or further way of achieving the replication method. One of ordinary skill in the art would recognize that the replication method can be altered to include additional techniques to further insure data consistency between subnet managers.

Argument A.3

Appellant argues on pages 8-9 of the appeal brief that the teachings of Kodialam cannot be combined with Pfister. Appellant argues,

“The Kodialam reference, however, is directed to a method of routing data that utilizes one network management module or system, which is similar to the “shared storage” method of Pfister. See, e.g., Kodialam, column 6, lines 27-36 and column 14, line 46 to column 15, line 10. There is no teaching in the Kodialam reference directed to the replication method as taught by Pfister. The teaching of Kodialam directed to the “shared storage” model cannot be combined with the teaching of the “replication model” in Pfister since Pfister specifically teaches that these two models are alternatives to one another and not combinable.”

Examiner’s response to A.3:

The examiner disagrees with Appellant's characterization of Kodialam as being similar to the “shared storage” method of Pfister. Kodialam is specification directed towards the derivation of database elements (Col. 3 lines 51-Col. 4 line 21 and Col. 14 lines 46-50 of Kodialam). While indeed there is a central network management module, this module merely provides the data that allows a node to produce the derived database elements. For instance, Col. 15, lines 1-10, states,

“Multicast forwarding table 610 may be constructed by controller 601 using information from a centralized network management system”
and

“forwarding table 610 may be constructed in accordance with the multicast routing method by controller 601 from network topology information and an NTP request contained in a control packet generated by, for example, network management module” (noting a forwarding table is a database element).

The node is still creating its **own copy** of the database elements separate from other nodes by deriving the database elements using the provided information. This is significantly different and in direct contrast from a “shared storage” method where a node would not need to derive the database elements as the node would have access to the shared storage containing the data. In other words, the database elements already exist on the storage medium that is shared between all the nodes and there would be no need for the node to create its own set of data.

The use of the network management module to provide data to allow the derivation of database elements is actually more similar to the replication method of Pfister. In the replication method, the master node explicitly sends information to the standby node so that the standby node can create its own copy of the data. Thus providing data to a node so that a node can derive a copy of the data is more similar to the replication method of Pfister.

Argument A.4

Appellant argues on pages 9-10 of the appeal brief that Kodialam fails to teach “computing derived database elements independent of which of the plurality of subnet managers assume the master subnet manager function”. Appellant argues,

“As stated above, the Kodialam reference teaches a central manager or “shared storage” model for performing the multicast routing method disclosed therein. As pointed out by the Examiner, Kodialam teaches the derivation of multicast forwarding tables within a router from information stored in a centralized network management system... Because Kodialam fails to disclose a change in management function and instead teaches only one central manager, Kodialam necessarily fails to teach the derivation of database elements independent of which of the plurality of subnet managers assumes the master subnet manager function as claimed...Kodialam cannot teach this limitation since it fails to disclose a switch in management function as claimed...The Examiner does not, and cannot, point to any discussion in Kodialam that teaches the derivation of database elements that is independent of the central manager because Kodialam contemplates only one such central manager. The Examiner must show that the Kodialam reference teaches independence as claimed in order to maintain the rejection and not just that the reference fails to disclose dependence. Appellant respectfully submits that the Kodialam reference teaches actual dependence in that the derivation of forwarding tables is dependent on the multicast routing tree that is present in the central manager. Furthermore, Appellant respectfully submits that even if the Examiner's assertion is correct and Kodialam fails to disclose any such dependence, the failure of Kodialam to teach dependence is not the same as teaching the independence as claimed.”

Examiner's response to Argument A.4:

Appellant mischaracterizes the “centralized network management module/system” of Kodialam as being one of the subnet managers. In Kodialam, the “centralized network management module” is separate from the nodes that the examiner equates to being the subnet managers. The examiner considers the nodes N1-N11 of figure 3 as being parallel to the master/standby subnet managers as these nodes are the nodes deriving database elements which are similar to database elements of the subnet managers (See col. 14, lines 46-53, and Col. 5 lines 1-4 of Kodialam). As seen in figure 3 and 6 of Kodialam, the network management module/system is separate from the nodes.

Furthermore, Kodialam does not indicate any kind of dependency between the nodes N1-N11 in deriving database elements. The examiner asserts this is sufficient in teaching the claimed limitation. Additionally, the claim language only states an independence from another subnet manager that has become a master subnet manager. The claim language does not indicate that other dependencies cannot exist. As such, the existence of a centralized network management module to allow the derivation of database elements at the nodes is not excluded from the scope of the claim.

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Argument B

Appellant's remaining arguments rely on the same reasons presented for arguments A.1 through A.4. As such, the examiner relies on the responses to arguments A.1 through A.4 in responding to the remaining arguments.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/David Lazaro/
Primary Examiner, Art Unit 2455
10/22/08

Conferees:

/saleh najjar/

Supervisory Patent Examiner, Art Unit 2455

/ARIO ETIENNE/

Supervisory Patent Examiner, Art Unit 2457